Case study title: **Vulnerability Assessment of a Port and Harbor Community to Earthquake-Tsunami Hazards**

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Case study emphasis: This case study focused on the vulnerability of port and harbors to earthquake and tsunami hazards.

Summary: This two-year research, planning and outreach initiative focuses on building resiliency within Pacific Northwest port and harbor communities to earthquake and tsunami hazards. To achieve this goal, a community-based planning process is being developed, through the use of two demonstration communities, that effectively integrates local stakeholder values, technical expertise, and GIS-based scenario development. Inputs include community workshops, field assessments, and a hazard/vulnerability GIS project. Outputs include community-based Mitigation Action Plans, tailored for specific elements of a port and harbor community. This methodology is appropriate and applicable for small- and moderately-sized coastal communities. For more information, refer to the following publication: Wood, N., Good, J., and Goodwin, B., 2002, Vulnerability assessment of a port and harbor community to earthquake and tsunami hazards: integrating technical expert and stakeholder input, Natural Hazards Review, 3 (4), 148–157.

Date that model application was completed:
The vulnerability assessment for the larger community hazard mitigation planning process was completed on March 1, 2001.

Case study geographical location:
This case study focused on the port and harbor communities in the Pacific Northwest. Two demonstration communities were chosen for the development of the planning process and vulnerability assessment process. They included the port and harbor communities surrounding the Yaquina River, Oregon, and Sinclair Inlet, Washington.

Vulnerability assessment indicators:
Resource vulnerability and community vulnerability, including buildings, infrastructure, populations, response operations, community recovery, local economy, and environmental resources

Methodology data requirements:
- GIS and other data on seismic and tsunami hazards for potential scenarios
- GIS and other data to facilitate vulnerability assessment, e.g., geology, ground shaking potential, soils, elevation, bathymetry, structural footprint, utilities, roads, demographics, historic landslides
- Information to support two community workshops: one focusing on Vulnerability Assessment and the other on Mitigation Options Development

Direct participants in the application of the model of the vulnerability assessment:
County, Local, and State/Provincial Governments
Non Governmental Organization
Private Volunteer Organization
Research/Training Institute
Civic Association
Private Consulting Firm

Economic and social sector participants directly involved:
Workshop participants included representatives from American Red Cross, residents, resort managers, retail store owners, port officials, an assisted living facility director, boat owners and commercial fishing officials, Chamber of Commerce and officials from city, county, state and federal agencies and departments.

Methodology objective:
This project focuses on building the resiliency of Pacific Northwest port and harbor communities to earthquake and tsunami hazards. To achieve this goal, a community-based planning process is being developed and tested in two communities. The process is designed to integrate local stakeholder values, technical expertise, and GIS-based scenario development. One component of this planning process is a community-based vulnerability assessment.

Methodology output:
- Community partnerships – a partnership network of port and harbor users, agencies, and businesses is created
- GIS-based exposure maps – numerous maps were created that showed which resources were exposed to the various hazards
- Prioritized vulnerability issues – stakeholders prioritize the numerous vulnerability issues, with regards to their impact on the entire port and harbor community

Results of methodology application at case study site:
Results of the community vulnerability assessments are prioritized at later mitigation workshops. From these discussions, a series of sector-specific mitigation action plans are created. These sectors include a) emergency services, b) lifelines, c) waterfront industries, d) tourism, lodging, retail businesses and residences, and e) community planning and the environment

Lessons learned:

- Building stakeholder partnerships early in the project is critical for project success
- Inclusion of stakeholder input has allowed assessments to elevate from resource exposure to community vulnerability
- Elevation from resource vulnerability to community vulnerability is an important step for prioritizing community mitigation actions
- Assessments from both geographic and functional (i.e., sector-specific) viewpoints provide more robust representation of community issues